

Spinal cord transection

INTENDED LEARNING OBJECTIVES (ILOs)

By the end of this lecture the student will be able to:

1. Explain complete transection of the spinal cord at different levels
2. Explain the findings in hemisection of the spinal cord

Complete Transaction of Spinal Cord

Its effects are according to the site of lesion

A) At upper cervical level = Immediate death.

B) At lower cervical level =

1. Quadriplegia (paralysis of 4 limbs)
2. Diaphragmatic respiration.

C) At mid-thoracic region:

1. Paraplegia (paralysis of lower limbs).
2. Normal respiration.

It passes into 3 stages:

I) Acute Stage (stage of spinal shock):

It lasts 2-6 weeks and characterized by:

1. Sensory: complete sensory loss at and below the level of lesion.
2. Motor: Flaccid paralysis (decreased M.T.) at the level due to LMNL, & below the level due to acute UMNL.
3. Vasomotor tone: lost → causes decreased A.B.P.
4. Micturition and Defecation: Retention with overflow.
5. Erection: Completely lost.

II) Stage of Recovery of Reflex Activity:

Voluntary movement and sensations never recover. It is characterized by:

1. Recovery of static component of stretch reflex (M.T), more in the flexors, so causes paraplegia in flexion.
2. Recovery of deep reflexes → as knee jerk.
3. Appearance of flexor withdrawal reflex.
4. Automatic Bladder.

5. Mass Reflex: In the form of mass response due to hyper-excitability when we do scratch below level of lesion as: sweating, micturition, defecation, and flexion of all the joints.

6. Coitus Reflex: Scratching of upper medial part of thigh → causes erection and ejaculation.

7. Vasomotor tone: Recovery = normal A.B.P.

III- Third Stage: *there is no third stage.* It is either: _

A) Under good care by:

1. Changing position of patient from time to time.
2. Application of antibiotic spray on any inflamed area.
3. Frequent evacuation of rectum and urinary bladder. In this case the patient will continue in the II stage but:
 - a. Paraplegia in extension (M.T. more in extensors).
 - b. Disappearance of mass and coitus reflexes.
 - c. Appearance of crossed extensor reflex.
 - d. Clonus.
 - e. Positive supporting reflex._

B) Under Bad Care:

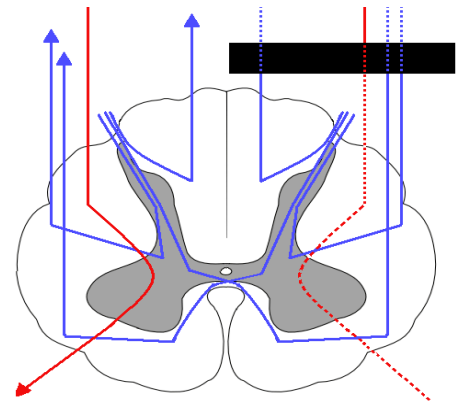
This causes appearance of Bed sores (skin ulcers due to loss of pain sensation) → which causes toxemia (infection with spread of toxins) → finally death.

Hemi section of Spinal cord
(Brown-Sequard Syndrome)

Effects:

I) At the level:

- **Sensory:**
Spinothalamic sensations → bilateral loss
Dorsal column sensations except touch lost at same side only.
- **Motor** → LMNL
- **Vaso-motor tone** → lost → decreased A.B.P.



II) Below the level:

- **Sensory:**
Spinothalamic loss in contra lateral side except crude touch.
Dorsal column loss on the ipsi-lateral side.
- **Motor** → UMNL
- **Vaso-motor tone** → Recovery.

III) Above the level:

- Zone of hyperesthesia, i.e. increased sensitivity due to irritation.

SUGGESTED TEXTBOOKS

1. Guyton and Hall textbook of medical physiology, thirteenth edition 2016, Elsevier, chapter 55, from page 695 to 706.